Patent
Docket No.: 54537US003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Fagan et al.

Serial No.: 09/185,208
Filed: November 3, 1998

For: Filled Lab Pattern-Coated Films

Group Art Unit: 1772

Examiner: Ahmad, Nasser

Declaration of Mark E. Fagan

I, Mark Fagan say and declare that:

1. I am a citizen and resident of the United States of America.

2. I received a BS in Chemical Engineering from Purdue University in 1988, an MS in Chemical Engineering from the University of California at Berkeley in 1992 and a PhD in Chemical Engineering from the University of Illinois at Urbana-Champaign in 1996.

3. I am employed at the Minnesota, Mining and Manufacturing Company (3M) in St. Paul, Minnesota and work in the Stationery Products Division Laboratory as a Product Development Specialist. I have been continuously employed by 3M since January 1996.

4. I am a co-inventor of the subject matter described and claimed in the above-identified patent application.

5. I have reviewed the U.S. patents cited by the Examiner in this application and identified below:

U.S. Patent No. 5,928,726 (Butler et al.)

U.S. Patent No. 5,608,003 (Zhu)

6. Both patents and the present application use silica particles as an ingredient in low adhesion backsize (LAB) formulations. However, the particle size range in the present application is outside the ranges listed and/or used in the Butler and Zhu patents.

7. I have summarized the particle size ranges in Table 1.

	Present Application	Butler, et al. Pat. N . 5,928,726	Zhu Pat. No. 5,608,003
Particle Diameter, μm	1 to 10 μm (2-10) Example 1 uses Syloid 7000 (4.6 μm avg.)	No size range stated. Examples use fumed silica. (Approx. 0.01 to 0.1 μm).	0.01to 1 μm (4-25) Examples use fumed silica. Examples range from 0.007 to 0.075 μm.
Particle Purpose	Gloss reduction (6-14).	No purpose stated.	Improved abrasion resistance (1-12).
Coating Thickness, μm	1 to 10 μm (2-10), Example 1 is 0.85 g/m^2, which is 1 μm thick.	0.005 to 100 um (6-21). Examples are 0.13 to 1.13 μm thick. (Tables 3 through 7)	Any thickness (6-2). As thin as "a few microns" (6-4). All examples are 10 to 12 μm thick (7-27)
Coating Characterization	60° gloss measurement ASTM D2457-90. Objective measurement of a coating property. (Tables 1 and 2)	Visual and microscopic. Subjective description of the coating texture. (Tables 3 through 7)	Visual. Subjective description of the clarity of the coatings (5-29).

8. In the present application, typical particle sizes range from 1 to 10 microns. Both Butler, and Zhu use fumed silica, which has a typical size range from 0.01 to 0.1 microns. However, Butler does not describe a suitable size range for the silica particles. Zhu selects a range from 0.001 to 1 micron, but uses particles of 0.022 microns in almost all of the examples. Thus, the silica particles in the Butler and Zhu patents are one to two orders of magnitude smaller in size than those in the present application.

9. The reason for the difference in particle sizes between the patents might be explained by their intended function. See Table 1, line 2.

10. In the present application, particles are used as gloss reducers (sometimes also called flatting agents, or matting agents). The particles roughen the surface and such a roughened surface has a lower gloss than a comparable smooth surface. The average diameter of the particles is greater than the thickness of the coating to ensure that the particles will provide the necessary roughness. In Example 1, the particles average 4.5 microns in diameter, and the coating is 1 micron thick.

11. In Butler, it is not clear why the particles are added to the coatings. In Zhu, they are used to improve the abrasion resistance of the coatings. In any case,

because the particles in Butler and Zhu are small relative to their coating thicknesses (see Table 1, line 3), it is unlikely the particles create surface roughness and reduce the gloss of their coatings. This is particularly difficult to imagine in Zhu, where the largest particles in the examples are 0.075 microns in diameter, and are used in coatings that are 10 to 12 microns thick. The particles are less than $1/100^{th}$ as thick as the coating. Any effect that the particles in Zhu have on the optical properties of his coatings (i.e. clarity) must be due to a different cause than surface texture modification.

Conclusion

Finally, neither Butler nor Zhu, measure any optical properties of their coatings. They simply describe their coatings in subjective terms and with no reference to a test method (see Table 1, line 4). Specifically, Butler is concerned with the apparent texture of his coatings, but does not explain the influence of silica particles on the appearance. Zhu is concerned, in passing, with the clarity of his coatings. Zhu only mentions that the transparency, translucency, or opacity of his coatings are affected by the silica particle size and whether other fillers are used (5-29), but does not explain how (see Examples 12-14).

In contrast, we objectively measure the gloss of our coatings, and use a specific, and referenced, test method (ASTM D2457-90). It is difficult to equate the influence of very differently sized silica particles on coating properties when there are no objective data to make the equality. In other words, Zhu's subjective descriptions of changes in coating clarity because of the choice of particular silica particle do not teach the use of large particles for the reduction of gloss. Nor does Butler teach that the addition of silica particles has any effect on the appearance of patterned LAB coatings.

I, the undersigned inventor declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful

false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed the 12th day of February, 2002 in Ramsey County, city of St. Paul, State of Minnesota, USA.

Respectfully Submitted By:

February 12, 2002

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